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Domain control and the enhanced electro-optical properties in relaxor single crystal PMN-PT

W. Zhao, X. Fu, Q. Hu, F. Qiu, X. Wei, Z. Xu

Electronic Materials Research Laboratory, Key Laboratory of the Ministry of Education & International Center for Dielectric Research, Xi'an Jiaotong University, 28 West Xianning Road, Xi'an, China
e-mail: Wdy@xjtu.edu.cn

Lead magnesium niobate-lead titanate $Pb\left(Mg_{1/3}Nb_{2/3}\right)O_3 - PbTiO_3\,(PMN-PT)$, is one of the most excellent piezoelectric and electro-optic crystals. The efficient EO coefficient $\gamma_c$and EO coefficients along different axis (γ_{31} and γ_{33}) were investigated, using a single beam electric-optic measurement system and a typical Mach-Zehnder interferometer. At the same time, small voltage signals with different frequencies were used to measure the frequency dependence of EO coefficient. The relationship between piezoelectric and electro-optic were studied in order to study the composition, anisotropy, and domain structure dependence of the EO coefficient. The deeper understanding of electro-optic effect will assist us to make reliable and stable optical instruments.

1. X. Wan, H. Luo, X. Zhao, et al., *Applied Physics Letters* **85**, 5233 (2004).